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## United States Department of Agriculture, DIVISION OF FORESTRY.

### IS PROTECTION AGAINST FOREST FIRES PRACTICABLE?

It has been claimed by many lumbermen and others that the burning of the *tops, slashings, or debris* thus resulting from their operations would be a "hardship" "too expensive," "impracticable," and that it is impossible to avoid or decrease the forest fires which we have to endure every year like a natural phenomenon.

There is now actual experience at hand showing that none of these claims can be sustained; that it is possible, practicable, simple, and cheap to protect large areas against fire; that it is possible, practicable, simple, and cheap to burn the debris in a lumberman's choppings.

In support of the first proposition we need only to quote from the Report of the Commissioner of Crown Lands of the Province of Ontario for 1895 regarding the working of the plan of forest-fire protection proposed by the American Forestry Association in 1882.

In explanation it should be stated that in Canada the forest growth is mostly owned by the Crown, the timber alone is sold in so-called limits; the cut from which equals now over 800,000,000 feet, B. M., bringing a net revenue to the Government of over \$700,000.

The report is as follows:

#### FIRE RANGING.

The total cost of this service for last year was \$26,253.81, of which \$12,080.82 was refunded by licensees, leaving the net expenditure \$14,172.99.

The fire ranging system was established in 1886. Its provisions are briefly as follows: The placing of a number of men during the dangerous period of the summer, say from May to the end of September, on licensed and unlicensed lands of the Crown where, from settlement, railway construction, lumbering, or any other cause, fire is so frequently used as to be a source of danger. The number of men necessary to give the proper protection is left to the owners of the limits, who are familiar with the topography, exposed position of the limit, etc., and they are also allowed to nominate or select the men to be employed, the department reserving the right to reject or remove any man whom it believes to be unfitted for his duties or who neglects his work. These men are instructed by the department and are, under section 14 of the fire act, officers for the enforcement of the provisions thereof. They are supplied with large posters of the fire act and pamphlet copies of the same, and are instructed to put up the posters in public and conspicuous places throughout the territory under their charge, and to hand pamphlet copies to settlers and others, so that they may have an opportunity of becoming acquainted with the provisions of the law and have no excuse for not obeying it. They are authorized to engage assistance should fires break out, and should these assume large and dangerous proportions they are required to notify the licensee and the department, in order that both may be represented on the spot should that appear necessary. The department bears half of any expense incurred in suppressing fires, as well as half of the wages of the fire rangers, whose remuneration is fixed at \$2 per day, out of which they have to defray their board, etc. At the end of the season they are required to send in their diaries and sworn accounts and a report upon the fires which occurred, together with the loss, etc.

The past summer was one of the driest for years, particularly in the country lying east of Sault Ste. Marie, and the experiences of the rangers in this respect are borne out by the reports of the various meteorological stations. \* \* \* As a consequence of the very dry and hot character of the summer there had to be a closer watch maintained everywhere, and in certain specially dangerous and exposed regions the staff had to be strengthened beyond what has been customary in an ordinary year, and in one or two instances where large fires occurred in outlying districts a staff had to be sent to the spot to fight the fire. I am glad, however, to be able to say that, owing no doubt in a great measure to the close supervision and systematic organization which existed, no large destruction of timber took place. The only fire of any consequence which occurred on unlicensed territory was in the township of Grant, where a considerable quantity of pine was so badly damaged as to render a sale of it advisable, so that it might be cut and not go to waste. The reports show that 46,556,000 feet of pine were damaged, and the estimated loss was \$38,450. Some of the licensees were unable to put a value on the damaged timber, but as nearly all were aware early in the season of the extent of the fires and the localities in which they occurred, they have made preparations to cut the timber, and the actual loss, therefore, will probably not be great. The chief causes of the fires seem to be the clearing of land by settlers and the carelessness of camping and hunting parties. It is customary to ask the licensees each year to point out any defect in the system and to make any suggestions by which they think it could be improved, but with the exception of a desire to make the keeping of fire rangers on limits in the summer time obligatory instead of optional there is no suggestion of amendment. They all seem to think that the service is admirably adapted to accomplish the object for which it was established.

As to the practicability of burning the debris of lumber operations, the following letters of H. M. Loud & Sons Lumber Company, located at Au Sable, Mich., will be convincing:

We have always made it a practice in our lumbering whenever possible to burn the debris in the fall or in the spring when the ground is somewhat damp, so that fires will not spread and when the wind is in the right direction. This has been a very successful method with us, as we have escaped in all the years that we have lumbered here from any destructive forest fires and we believe had we not taken the precautions, that our losses would have been enormous.

The open chopping dries out much more quickly in the spring than the neighboring timbered land; consequently the fire will burn in the open and stop as soon as it comes to the timber, and we have never yet had any difficulty in confining the fire to the desired limits. It only requires common sense or good judgment to know when the proper time is to burn the choppings and so cover this menace to our uncut timber.

And the following, dated April 18, 1896:

I have just returned from our lumbering operations which are at present in the southern part of Montmorency County, 70 miles distant, and noticing on my arrival there that the conditions were just right for burning, I had the fires started at once in our choppings, and in two days we had burned over our choppings in that locality.

The method which I pursued was to send out four men with torches nearly like those used for campaign purposes, holding about a quart of kerosene oil, with ordinary candle wicking, and with these torches they can go rapidly from pile to pile of debris, setting fire very rapidly and covering a large territory. The piles were dry enough to burn very freely, but the ground was somewhat damp and fires would die down as soon as they reached the limits of the chopping. For the ground covered, the expense would not exceed \$10, burning over probably 2 square miles.

The timber surrounding this chopping just burned over amounts to probably 100,000,000 feet, worth \$500,000 and stands very thick, averaging about 600,000 to 1,000,000 feet to the 40 acres. We now feel very safe for the summer in working in this green timber, as the fires can not come in on us from the choppings of last year.

Michelson Hanson Lumber Company, of Lewiston, our neighbors in that locality, follow the same method with the same results. This burning over is a very good insurance and, as you can see, the small amount it costs is money well expended and, in fact, we consider it *would be criminal carelessness* of our part if by this watchfulness we did not guard against the losses in the interests of our neighbors.

It may be added that it is the practice in well-conducted lumber camps to pile together as much as possible of the brush and tops remaining from the operations of the log cutter, so that a number of small heaps of brush are scattered through the woods. These dry out faster than the litter on the ground, and can be burned at the proper time with little danger of spreading the fire. It would be impracticable and expensive to move these brush heaps, as has been suggested, but as shown above they can be burned where they lie with a minimum of damage and least expense.

#### THE COST.

It will be observed that in Ontario the cost of the protective service was equal to  $3\frac{1}{4}$  cents per thousand feet harvested, while for the lumber companies' burning of the debris \$5 per square mile is estimated, which may be calculated to represent a tax of one-tenth of a cent per thousand feet of choppings. Even if we increase this figure to one-fourth of a cent per thousand feet, B. M., placing the cut of the three great lumber States—Michigan, Wisconsin, and Minnesota—at round 13,000,000 thousand feet, it would appear that an expenditure of less than \$35,000 would obviate a large amount of the terrible loss which counts up into millions of dollars annually. And if to this precaution be added a service similar and at the same expense as that so successfully carried on in Ontario, the cost to the three States would be less than \$450,000. Compared with the annual fire loss even this extravagant sum would be a small matter; we are inclined to believe that much less than \$100,000 for each State, properly spent with a well-organized service of specially employed forest guards, would obviate nearly all the forest fires.

We would call special attention to the wisdom and thoroughly democratic spirit of the Canadian system, which gives to the parties most interested in protecting their property a voice in the selection of the guards.

As shown in Circular 13 of this Division, organization based on political lines is attempted by the recent legislation in several States, notably Maine, Wisconsin, Minnesota. While this is an advance upon the conditions hitherto existing, the apparent attempt of cheapening the service, of getting something for nothing, or nearly so, it is to be feared, will largely depreciate the effectiveness of the legislation.

The kind of organization attempted by this legislation is largely of the same sort, as that of the old city and village fire engine companies, which relied entirely upon voluntary exertions, and is now happily superseded by a paid service. In the same way nothing short of a specially organized and paid fire service will be entirely satisfactory in preventing and checking forest fires.

To get a conception as to what is really lost in these forest fires and to show how insignificant in comparison to the result the expenditure of such a sum for protection would be the following computation by the Forest Commissioner of Pennsylvania is quoted:

The most obvious consequences of forest fires, serious as these may be, are by no means of the greatest importance. Loss of logs, of bark, of standing timber, young and old, of fences, and occasionally of buildings, is, as stated elsewhere, not less than a million dollars annually to this Commonwealth (Pennsylvania). This might well enough be termed a direct loss to the State. The indirect or consequential damage to the State is many times greater. In fact, it is so great that it appears incredible until a careful study of the whole subject is made.



For example, it is fairly within bounds to assert that with all the unproductive lands now vacant and uncared for which exist within the limits of the State were protected from forest fires, for say forty years, the timber then growing would be worth not less than \$1,200,000,000. Now it would seem that if this growth were destroyed by fire when but a year old, the direct loss to the Commonwealth would be absolutely unimportant. The same might be said if we were to see it destroyed at two, three, four, or even five years of age. But when we remember that in burning these seedlings, which are but a year old, we destroy a crop which in point of time is one-fortieth of its way on to a money value of \$1,200,000,000, the damages are consequential or indirect in character, and if expressed in figures, must equal not less than \$30,000,000 as the loss to the Commonwealth.

To be sure, forest fires can probably not be altogether prevented by any system, but they can be reduced to a minimum.

Regarding the use of spark arresters for locomotives, see Bulletin I, Forestry Division; regarding the making of fire lanes, safety strips along railroad tracks, and other means of protection, see Report of Forestry Division for 1892.

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